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Franciscan Missions of California

A VIVID picture of the early history of the city of which the Society was a guest upon the occasion of the recent Fall Meeting was drawn by President Bush in his response to Mayor Harry C. Clark's welcome to San Diego. In part, President Bush said:

"Prior to 1542, Mexico and Central America had been subjugated and partly explored by Cortes, but what is now the State of California was unknown, although thickly inhabited as determined later by approximately 700,000 aborigines of a very low type, and advanced only in a minor degree above the brute creation. The family was the nearest approach to the social unit, and there was no common language, nor tribes as have existed generally among the other aborigines of our country. Among the natives living around San Francisco Bay 19 distinct languages were spoken.

"The diet of these natives in general consisted of fish and animals, acorns, berries, roots and seeds, with grasshoppers, insects and reptiles classed as delicacies; and the Southern California Indians added to this menu coyotes, crows, and skunks. Polygamy was general, and daughters were purchased as commodities from their fathers, the older and generally wealthier men having a monoply on youth and beauty. A man married all his wife's sisters and her mother, if unattached.

"It was believed by Hernando Cortes, the Conqueror and Governor of Mexico, that the Americas were a group of islands skirting the coast of Asia, and that Mexico was either a projection of Asia or was separated from it by a Northwest Passage.

"Cortes commissioned Juan Cabrillo, a Portuguese navigator, to explore these islands of the coasts and seas and seek a Northwest Passage. In 1542 Cabrillo dropped anchor in a deep, land-locked bay of 22 square miles and named it San Miguel, now known as San Diego Bay. Without landing, he sailed north along the coast of California and returned to the Santa Barbara Islands where he died in 1543 without accomplishing his mission.

"Sixty years later on the twelfth of November, 1602, the day of Saint James of Alcala, Sebastian Vizcaino, a Spanish navigator, entered the Bay of San Miguel and renamed it San

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Getting a Start

APPARENTLY the palm for the first Student Chapter activity of the current year goes to the University of California Chapter. At least the first report comes from John W. Parks, its Secretary, who notes that the first meeting of the Chapter (on August 29) was attended by 86 members, and was so lively and interesting as to promise a fine year ahead. The membership is 136.

Colleges on the Pacific Coast have several weeks' lead over most others in the matter of starting the school year. If Student Chapters of other colleges, therefore, cannot expect to vie with the California Chapter, at least they can emulate it in promptness and activity.

The Fall Meeting

WHAT'S to be said about the Fall Meeting at San Diego must be said with superlatives. The meeting was a great success.

Registrants totaled 487, an unexpectedly large number. They came great distances. There were 43 from cities on the Atlantic seaboard. There was a total of 86 from east of the Continental Divide. Upper California and Nevada sent 92, and Southern California sent 280. The group was characterized by the presence of engineers of outstanding reputation.

The El Cortez contained hardly a guest that was not of the party, and it was filled to overflowing. Thus, meeting headquarters assumed the character of a resort hotel with all the attendant features that go to make for the success of a meeting under such circumstances.

The Technical Sessions were particularly well attended. At one time, on Thursday, 175 men were giving close attention in one room, 40 in another, and 40 in a third, the ladies at that moment being driven about the city, through Balboa Park and to Coral Strand.

To the Navy, and more particularly to Admiral Reeves, and his Staff of Officers and Pilots, the Society's thanks are especially due. Admiral Reeves in two addresses fascinated all who heard him and through his courtesy and that of his Staff about 40 members were given the rare treat of an hour's flight in the big bombers. Others visited the warships in the harbor and many from far inland had a chance to inspect a submarine.

Technical and social sessions alike were of unusual interest and those who came—even perhaps 3000 miles—to enjoy them, expressed themselves as well repaid.

November Proceedings

A VARIED assortment of subjects greets the eye of the inquirer as he looks over the contents of the November Proceedings.

The first paper, "Letting Construction Work by Competitive Bidding", is by Edward W. Bush, Member. Taking up various phases of construction contracts in all their many aspects, one at a time, he develops his argument in brief form and nails down his point with a pithy statement of principle, each suggested to give the owner the maximum value for his money and at the same time leave the contractor a profit commensurate with his ability and with the risk assumed under the contract.

According to W. W. K. Freeman, Associate Member, in his paper "Pumped - Storage Hydro - Electric Plants", one such plant has been built in America and many have already been constructed in Germany. During periods of low demand, surplus power is used to pump water to high reservoirs from which it may be drawn when needed for the peak load; that is, cheap power is used to provide against the demand for costly power. The rapid developments of this new type, he states, "make it appear that America is on the threshold of a new phase of hydro-electric development."

Two papers presented before the Highway Division appear as a Symposium under the title "Economic Comparison of Various Types of Road Surfaces". The situation in New Hampshire is developed by F. E. Everett, Member. On the other hand, conditions in Wisconsin, quite different, are examined by H. J. Kuelling, Member. In each case, statistics are given showing the basis on which the economical types are determined to suit the local conditions.

Among the important activities of the Surveying and Mapping Division, is the study of control surveys. As a part of this work, the first report is on "Horizontal Control", by George L. Hosmer, Member. After discussing the general features and purposes of horizontal control, he classifies surveys with their corresponding errors of closure and describes triangulation work, traverses, monumentation, and geodetic datums. The report is an excellent summary of the essentials of this work.

Numerous discussions follow. These deal with many of the papers previously published in Proceedings, on which comments are still open. These discussions total 34 contributions applied to 14 papers. Finally, memoirs of 9 deceased members are included.

Papers Available

THE Society is justly proud of the engineering literature contained in the Transactions issued during the past 59 years. New members doubtless do not have the older volumes, but as most of their contents is available in pamphlet form, they may make selection of papers of particular interest and purchase the same at special rates.

As each volume of Transactions has been issued, reprints of the papers have been made. The stock of some, of course, has been exhausted, but of the 1697 papers that have appeared in Transactions since 1867 a supply of reprints is available of 1370 different titles.

To keep members informed of the scope of the Society's literature, an Index to Transactions, for Vols. 1 to 45 was issued in 1901, and a supplement thereto, Vols. 46 to 59, inclusive, was published, in 1908. A cumulated Index covering Vols. 1 to 74 was issued in 1912 and another covering Vols. 1 to 83 was brought out in 1921.

In Proceedings for March, 1920, a selected list, with prices, was published of those papers that had appeared in Transactions since 1912. Copies of this list are available for distribution free. It is expected that a complete and improved Index will be published in 1930.

In the meantime, however, information on the papers available covering any subject will be furnished for the asking.

Community Service

INTEREST in community engineering problems has been one of the marked successes of the Society's Local Sections. An illustration very much in point comes to hand in the form of a document from the Lehigh Valley Section entitled "Annual Report of Water Supply Committee". So important was the matter considered that the Section had the report printed for a general distribution.

Indeed this publicity might well be given to such an interesting review. One important phase of wide interest in any State is the matter of water supply, especially as it concerns the contamination of streams. Some of the more important observations developed at a conference are quoted.

The Committee emphasizes a matter of general interest in Pennsylvania — as doubtless elsewhere — namely, the trend toward consolidation of public utilities, in this case, those concerned in the water supply field. Several specific private corporations interested in this work are enumerated. No suggestion is made as to the direct application of the information, but doubtless members of the Lehigh Valley Section will find a great advantage in having at their fingers' tips these data which so closely concern them as engineers and citizens. The interesting report is signed by the Section's Water Supply Committee, comprising G. Douglas Andrews, H. G. Payrow, and Robert L. Fox, Chairman.

When Down Is Up

AS the story goes, a certain Indian evolved a new form of transportation which *appears* to defy the general laws of gravitation. W. E. Elam, Member, forwards the information.

A particular stretch of the Mississippi River, known as the Greenville Bends, is the site of the Indian's supposed exploit. The name seems to be entirely appropriate, as the river at this point consists of many loops and curves continually doubling one on the other.

According to the story the Indian started at one of the lower bends and floated down stream until he came to the narrow neck separating him from the next loop up stream. A "carry" of a few hundred feet brought him to a higher reach of the river. So the operation was repeated again and again — floating down; carrying over; floating down; and carrying over. Thus, by floating down stream 16 miles and carrying his canoe across a few portages on foot, he was 45 miles farther up stream than when he started.

Think it over!

A Goal

WHAT proportion of its available "clientele" should a Local Section obtain as members? "But," you will say, "that depends — circumstances alter cases."

So they do. Well, here is the way Edward P. Lupfer, Member, President of the Buffalo Section, looks at it: He holds the Section responsible for members in Western New York State and Eastern Ontario, Canada. Very good—that means 113 members in all. Of these, twelve have just been induced to join the Section, making 60 members at present, and during the year it is aimed to add 10 to 15 more. That is, to reach 65% of the attainable or perfection is that Section's immediate goal. What is yours?

Stevenson—Stephenson

AN almost identical spelling of names has always led to confusion between the famous engineers Robert Stevenson (1772-1850) and Robert Stephenson (1803-1859). Recall that Stevenson was mentioned in the February Proceedings, Part II, in connection with John Rennie and the Bell Rock Light. Promptly a member wrote in to question the spelling, for the Society Proceedings cannot "get away with" any looseness in such matters. Having been satisfied (fortunately the February account was correct) he suggests that other members "may be as much in the dark".

This preamble takes longer than the story itself as quoted from the letter of explanation. "Both Stevenson and Stephenson were eminent English Engineers and died during the 50's of the last century. In a sense, then, they were contemporaries, and hence the tendency to confuse them. In fact, however, Stevenson was a generation ahead of the other, being almost 30 years of age when Robert Stephenson was born. The fact is that some of Stevenson's important work as, for example the Bell Rock Light (in 1807), was accomplished when he was relatively young. Stephenson was then a mere child.

"The confusion between these names is quite common. There is no indication that the families were related."

I. S. C. "Shrine"

TO what man or woman who has been associated with Iowa State College does not the sounding chimes in the Campanile cause the pulse to quicken and the mind to revert to past struggles, despair, conquests, acquaintances, activities, illusions, ambitions, and reminiscenses in general?

THE CAMPANILE
IOWA STATE COLLEGE
BY DON KING

Don King, a member of the Student Chapter at Iowa State College, submits an article on what he calls the "shrine" of his Alma Mater. He has done more. The sketch is by his hand. What other shrines have our universities or colleges?

It is this brick tower with its sympathetic carillon which has involuntarily taken so great a part in the lives of those who can proudly claim that Alma Mater and to those who will some day boast a similar claim. Truly the shrine of Iowa State College, it carries on its untiring work as an eternal fountain of understanding and consolation.

The brick masonry structure was erected by the State in 1897 to accommodate 10 bells, the largest weighing 3600 pounds and the smallest 450 pounds. Because of their destined use, a Special Act of Congress allowed the bells to be imported from Loughsborough, England, duty free. They claim the distinction of being the first scientifically tuned bells to be brought into the United States. The chimes which have been striking every 15 minutes for more than 30 years are a memorial to Mrs. Margaret McDonald Stanton, wife of the late Dean Edgar W. Stanton.

A recent bequest by the executrix of the Stanton estate has made possible the purchase of 26 new bells, the largest weighing 5200 pounds and the smallest 30 pounds. Strengthening of the tower will be necessary, but the outside appearance will remain the same. This new carillon will be a memorial to Dean Stanton and will perpetuate the memory of his wife.

Clarence E. Bardsley

ANOTHER emissary of the Society and of American engineers has reached Germany in the person of Clarence E. Bardsley, the new appointee as Freeman Scholar. Scanning Professor Bardsley's record, one is impressed with the fact that primarily he is a student and scholar. This is evidenced by his attainment of a Doctorate (Sc. D.)—in itself a decidedly unusual accomplishment for an engineer.

On the other hand his early experience in railroad work in the Middle West and, later, that with the U. S. Geological Survey, and, finally, his teaching at the Missouri School of Mines, should give him a most fitting background for his new undertaking. If capacity and energy are the essentials for this important post, it is evident that Professor Bardsley can readily qualify.

Through the generosity of John R.

Freeman, Past-President, the Society is possessed of a capital sum, the interest of which permits a generous contribution to a designated recipient for travel abroad. The contacts which Mr. Freeman is able to bring about through his foreign friends is a still further contribution. Last year three representatives were studying in European hydraulic laboratories, as a result of this fund. This year there will be two, Lorenz G. Straub and Clarence E. Bardsley.

Newton's Principia

RECENTLY the Engineering Societies Library has acquired a copy of the first edition of Newton's "Principia". The volume, a large quarto in a contemporary English calf binding, and in unusually fine condition, is the gift of Dr. Edward Dean Adams, Fellow.

First editions of this famous book are exceedingly rare. Only a few copies were printed and these, because of the importance of the work, were rapidly distributed. Even four years after publication a copy could scarcely be procured.

The "Philosophiæ Naturalis Principia Mathematica"—to use the full title—was published in 1687, in London, by the Royal Society; but as the Society was embarrassed financially at the time, the expense of publication was actually borne by the astronomer, Edmund Halley. It fell to the fate of Samuel Pepys, then President of the Society, to give it the "Imprimatur".

Probably the most important book on exact science ever written, it certainly is one of the most consistently original. For the first time it formulated the fundamental laws of mechanics, and the mathematical ideas required in the arguments were invented by its author. Indeed it clarified phenomena which had never been explained satisfactorily and initiated problems that still occupy our best minds.

Service to Members

MEMBERS may visualize the Headquarters Office as a quiet place, where routine work occupies most of the time, and no one ever gets excited—except, perhaps, during the busy week of the Annual Meeting. But when a cry for help comes from a member in a far-away land, resources are mobilized, and the need is supplied, if possible.

Recently, on a Saturday morning, about nine-thirty, a telegram was received from a member resident more than 2000 miles from Headquarters, reading something like this: "Please send me immediately, by airplane mail, best treatise on ————." A call upon the Engineering Societies Library showed that a certain English publication seemed to be the most suitable. After telephoning to three book dealers in the city, one was found who had the volume, 1928 edition, costing fifteen dollars.

A Western Union messenger boy was summoned and sent off to the dealer who, it happened, was located in Lower New York, some distance from the Society's Office. At five minutes after twelve he came back with his purchase. The book was wrapped and weighed and rushed to the General Post Office in a taxi. The postal charges amounted to more than eleven dollars, but the book was now safely on its way, due to reach the member early Tuesday morning.

Franciscan Missions

(*Continued from page* 1)

Diego, meaning Saint James. He attempted no settlement but explored the coast northerly to the mouth of the Columbia River.

"In 1579, Sir Francis Drake, availing himself of every opportunity to plunder Spanish ships, wintered near San Francisco Bay, but did not discover it, and named the country New Albion. He assumed formal possession in the name of his royal sovereign, Queen Elizabeth, established no settlement, and sailed away.

"The Spanish Government feared the occupation of California by the Russians and ordered the establishment there of missions, presidios, and pueblos. These missions were supported by 'Pious Funds', which consisted of contributions from devout Catholics for proselyting the California Indians and were almost wholly invested in buildings, lands, cattle, horses, and sheep. From 1769 to 1823, 21 missions were established in California, and 88,000 Indians were taken into the Church.

"The Presidios were the centers of military activity, established at or near the missions for protection against the Indians and aggressions of Russia. Russia made no aggressive steps at occupation. The natives proved peaceable, and the soldiers served largely as police and laborers, and the Presidios soon went to ruin. The Pueblos, or village organizations which were attempts at secularization, were total failures and only two of these California Pueblos located at San Diego and Los Angeles ever became accomplished facts.

"In 1821, the rebellion of Mexico against Spain ended with the independence of Mexico, and California passed from Spain to Mexico. Her domination of California from 1821 to 1847 was characterized by mismanagement and placed all burdens for the support of the Presidios and Pueblos on the Missions which latter supported themselves. California was made a penal colony for Mexico.

"In 1846 and 1847 the United States and Mexico were involved in war. In 1846 Commodore Sloat took possession of Monterey and claimed the conquest of California by the United States, and the American flag was raised in the Old Town Plaza at San Diego by John C. Fremont in July of 1846; and it has been written that the mission system as a further active force in the life of California ceased to exist. San Diego became the United States Army Headquarters for Southern California, and the mission was occupied for army barracks until 1858.

"In 1867, Alonzo Horton of San Francisco, the modern founder of San Diego, purchased from the Village Trustees 960 acres of land at the present site of the business district, for 27 cents an acre. He built San Diego's first modern hotel, its first large dock, and gave liberally to its institutions. Shortly thereafter, the first boom in Southern California took place.

"In 1888 the Santa Fé Railroad completed its line into San Diego and the second great boom followed.

"The old original Erie Canal, completed in 1825, with a three-foot draft for boats carrying maximum cargoes of 80 tons, is buried with the past, but it pushed our Western frontier from the banks of the Hudson River through the Great Lakes out into the Mississippi Valley and also established the supremacy of New York City. If such was the influence of one circumstance of a material nature, the question may be asked of this other of a spiritual nature: "Who can measure the influence of these original 21 Franciscan Missions on the life of California?"